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# *The* AMERICAN JOURNAL *of* MEDICAL TECHNOLOGY

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## MORPHOLOGICAL DIFFERENCES IN MONONUCLEAR CELLS\*

By ESTELLE MARION DOWNER, B.S.

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Wherever and whenever technologists working in the field of hematology gather together the question persistently and perennially arises, "How can one differentiate with reasonable certainty between mononuclear cells particularly the lymphocytes and monocytes." Too much cannot be said of the importance of classifying accurately the many cells that may be found in the blood smear. A meticulous study of the blood smear with an accurate identification of blood cells is essential to the doctor in reaching an accurate diagnosis of a case. A careless examination with a vague notion as to the identity of cells may often obscure a diagnosis.

A morphological study of blood cells is no easy matter. However, a systematic approach to the study of cell morphology will clarify many problems.<sup>1</sup> I shall present to you a few suggestions

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\*Presented at the Annual Convention of the American Society of Medical Technologists, Philadelphia June 10, 1942.

about the preparation of blood smears, a few principles for the study of blood cells, a few criteria for the identification of the cells that usually offer the greatest difficulty to the technologist namely the myeloblast, the myelocyte, the lymphocyte and the monocyte.

First and foremost, a well prepared blood smear is indispensable. Excellent preparations are within the ability of every technologist. The following are the significant points to observe:

1. Scrupulously clean slides are a prime requisite. Sufficient treatment with 50% sulfuric acid saturated with potassium dichromate, followed by adequate washing in water and storage in 70% alcohol yields acceptable slides.<sup>2</sup>
2. A sufficiently small drop of blood must be used—a drop of such size that the red blood corpuscles are not in rouleaux formation nor that they occur too sparsely.
3. Perfect staining of the blood film is essential. Excellent staining reactions are obtained with a proper buffer solution. We have been using a buffer solution with a pH of 6.45 with Wright's stain. Our results for the most part have been beyond reproach.

With a meticulously prepared blood smear on hand, we can proceed to a morphological consideration of the blood cells. Morphology is a study of form and structure of organized beings which translated into the realm of hematology means a minute and detailed scrutiny of the structure of the blood cells. For a critical study of a cell, attention must be directed to the following structures as they appear in the fixed blood film stained with Wright's stain:

1. Nuclear pattern
2. Microscopic characteristics of the cytoplasm
3. Proportion of the nuclear volume to the cytoplasmic volume
4. Size of the cell

#### *Nuclear Pattern<sup>3</sup>*

First, the nucleus consists of two types of chromatin, the basichromatin which is the portion of the nucleus staining a deep blue and a lighter staining portion called the oxychromatin or parachromatin. It may be described aptly as the light material found

among the coils of the chromatin. Second, the basi-chromatin may be extremely fine and mesh-like or it may be coarse. The fine chromatin is called "leptochromatic"; the coarse is called "pachy-chromatic". The specific arrangement of the basi-chromatin and the oxychromatin, and the relative fineness or the coarseness of the chromatin constitutes the nuclear pattern.

Third, in studying the nucleus, it is of paramount importance to observe the presence or the absence of nucleoli.<sup>4</sup> Nucleoli are distinct, lighter staining bodies in the nucleus. The nucleoli have a "punched out" appearance with a condensation of chromatin around them. Some describe them as having a "crater-like" appearance. They are important because they are found only in the very immature cells like the myeloblast and the lymphoblast.

Fourth, it is helpful to note the type of nuclear membrane—whether the membrane is thin and hardly perceptible or if it is pronounced.

### *Cytoplasm*

The color of the cytoplasm needs no elaboration. The type of granulation found in blood cells needs much elaboration. It is for the most part sadly neglected. Granulation in the leukocytes is of two types:

1. Specific granulation
2. Azurophilic granulation

Specific granulation is the granulation found in the neutrophil, the eosinophil and the basophil and their respective myelocytes. It is slowly formed as these leucocytes mature and persists without change in number until the cell dies. Cowdry<sup>5</sup> states, "Specific granules must be regarded as constant, specific elements in the cell organization definitely related in some manner to its particular function or manner of life."

Azurophilic granulation is the source of much perplexity to most technologists. The term "azure" per se means a blue color. Yet, granulation so designated is anything but blue. It is red with a bluish cast. This seeming confusion of terms exists because few realize that the azure color is due to a metachromatic reaction, that

is, the blue color of the methylene blue component of the polychrome dye changes to the reddish color.

#### *Proportion of Nuclear Volume to Cytoplasmic Volume*

Observance of the relative amount of nuclear material to cytoplasmic material is an added criterion to differentiation of mononuclear cells. It hardly requires explanation.

#### *Size of the Cell*

A consideration of cell size is a further criterion of cell differentiation. It is well to remember that the size of cells should not be judged by the diameter of an individual cell. Rather the relationship of the sizes of cells in a particular smear should be considered. Changes in the diameter of cells may occur because the size of the cell in a fixed, stained smear depends on such factors as:

1. Thickness of the blood smear
2. Crowding of the cells
3. Speed of drying the blood film
4. Type of fixation used
5. Type of solvent of the stain

#### *Specific Differentiation of Cells*

Before going on to the specific differences in some of the mononuclear cells, let me emphasize that it is the nuclear pattern of any cell which will most surely identify the cell accurately. Such factors as cell size, relative proportions of nuclear volume to cytoplasmic volume, even the cytoplasmic granulation may vary under pathological condition. The nuclear pattern tends to remain most constant.<sup>6</sup>

In studying the salient points of differentiation between the myeloblast, the myelocyte, the lymphocyte and the monocyte, we shall turn our attention foremost on the nucleus and secondly on the other factor.

Let us consider the morphology of the myeloblast.<sup>7</sup> The nucleus shows a diffuse distribution of very delicate chromatin. There is a sharp differentiation between the basi-chromatin and the oxy-chromatin or the parachromatin. Nucleoli are usually present but

they may be absent in some cells. These are variable as to size and number. The nuclear membrane is extremely thin and hardly perceptible.

The cytoplasm is deeply basophilic in some cells; it is rather pale in others. Azure granules may or may not be present.

In most myeloblasts, the nucleus takes up about nine tenths of the cell.

The myelocyte presents a nuclear pattern totally unlike that of the myeloblast. The chromatin occurs in large, irregular clumps although the basi-chromatin is still sharply differentiated from the oxy-chromatin. No nucleoli are ever found. The nuclear membrane is more distinct than that of the myeloblast. The nucleus is more compact resulting in the apparent increase in the amount of the cytoplasm.

The great distinguishing feature of the myelocyte is the appearance of the cytoplasm. It is pale pink or pale blue in color. It is covered evenly and completely with the specific granules described before—be they neutrophilic, eosinophilic, or basophilic granules.

No two cells create a more frequent problem of identification than do lymphocytes and monocytes. I shall present the morphological differences of these two cells side by side to better emphasize the conspicuous microscopic distinction between them.

The nucleus of the lymphocyte is characterized by thick, heavy, deep staining masses of chromatin arranged in a "block-like" or "cloud-like" pattern. The separation between the basi-chromatin and the light bluish or colorless oxychromatin is very indistinct. There is a gradual merging of the two types of chromatin.

The nucleus of the monocyte presents strings of finely distributed chromatin which is distinct from the oxychromatin. The crossing and recrossing of this chromatin causes nodules to appear in the nucleus.

The nucleus of the lymphocyte is round or slightly indented; the nucleus of the monocyte is kidney bean shaped.

No nucleoli are found in either cell. The nuclear membrane of the lymphocyte is quite thick; that of the monocyte, medium thick.

The cytoplasm of the lymphocyte may be deep blue in color or it may be a delicate blue but the cytoplasm is clear. The cytoplasm of



the monocyte is characteristically a slate gray or a blue gray and it is definitely muddy.

The difference in the cytoplasmic granulation of the lymphocyte and the monocyte is striking indeed. About ten per cent of the lymphocytes show azur granules. These, if they occur, are large, discreet and are confined to some one part of the cytoplasm. Almost every monocyte shows a characteristic azure granulation of the cytoplasm. This granulation is extremely fine, and dust-like. So fine is it that only careful focusing with the thumb screw of the microscope will reveal it. It is known as "azure dust".

In conclusion, let us remember the myeloblast by the extremely fine, sieve-like arrangement of the chromatin and the presence of nucleoli in the nucleus. Let us remember the myelocyte by the clumped, rather coarse chromatin, the absence of nucleoli and the characteristic specific granulation. We shall recognize the lymphocyte by the "block-like" arrangement of deep staining masses of basi-chromatin and its clear, blue cytoplasm. We shall know the monocyte by its kidney-shaped nucleus with the stringy, sometimes nodular chromatin, the muddy, slate gray cytoplasm, and most of all by the ever present "azure dust".

I consider it a distinct privilege to appear before you. I sincerely hope that the few bits of information will help to dissipate some of the confusion in the identification and the classification of mononuclear cells.

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## INTER-AMERICAN COOPERATION IN HEALTH WORK

By COLONEL ALBERT R. DREISBACH

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There is a phase of inter-American cooperation which presents a particularly striking contrast with the aggressions of militaristic powers. A high order of cooperation has been achieved among the American republics in the interest of building a peaceful and better civilization in the New World and protecting this hemisphere against the designs of would-be world conquerors. Inter-American cooperation has progressed to new heights of achievement in the past eighteen months. Notably it has moved forward in the field of health and sanitation.

The health and sanitation work has evolved from the conference of American foreign ministers held at Rio de Janeiro soon after Pearl Harbor. That conference, as you may recall, adopted a large program to strengthen the defenses of the hemisphere and to mobilize the economic resources of the Americas. To support this mobilization, the conference recommended cooperative health and sanitation measures, to be undertaken by the American republics within their individual capacities to contribute funds, technical skill, materials and labor. In accordance with the Rio recommendations, the United States has entered into health and sanitation agreements with sixteen of the other American republics. This work rests on the firm foundations laid through many years of health progress by the other American republics, by private organizations and by the Pan American Sanitary Bureau. The pioneering and established organizations are aiding in generous measure the supplemental program which was made necessary by the scale of wartime projects for defense and for mobilization of hemisphere resources.

This supplementary program has taken form in wartime. It has

its origin in wartime necessity. This necessity in part is the imperative need for developing new and additional hemisphere resources of minerals, fibers and other tropical-grown materials. These are required partly to offset loss of supplies from outside the Western Hemisphere. This humane work in the field of health and sanitation is symbolic of the friendly relations of the American republics, of their sincere urge to cooperate and to work closely together toward the goal of making life in the Americas better for the average human being. The hospital built through inter-American cooperation might well symbolize the constructive objectives of the inter-American system. It is a symbol which speaks for the saving of human lives. The cannon, the symbol of military aggression, stands for destruction of human life.

The doctors, nurses, sanitary engineers and others at work in the inter-American health and sanitation program are legions of peace. They are carrying into action the Good Neighbor spirit which animates inter-American relations. The program embraces hundreds of construction projects and health activities. These include many new hospitals, health centers, dispensaries, nursing schools, sanitation works and training projects. These add up to the largest health and sanitation program yet undertaken on the basis of inter-American cooperation. The nursing schools, hospitals and health centers will remain after the war as monuments to the peaceful and the humane goals of inter-American cooperation.

Long ago, through such institutions as the Pan American Sanitary Bureau, improvement in hemisphere health standards was recognized as one of the major objectives of inter-American cooperation. Now the need for inter-American collaboration in this work is more compelling than ever. War, even while it results in wholesale destruction of life, generates counter-measures to protect life. We have our soldiers of production on the home fronts as well as soldiers on the overseas battle fronts. And, for the safeguarding of the Americas, it is just as necessary to have healthy soldiers on the production fronts as on the military fronts. One aim of the health and sanitation program is to help protect our soldiers of production while, at the same time, continuing to move toward the long-range goal of higher living standards for the peoples of the Americas.



Nicaragua Health—Reception room of the Public Health Clinic in the Managua Nicaragua.



Dr. Juan Allwood Paredes, Director of the Sanitary Clinic at Santa Tecla, El Salvador, prepares to examine a patient's throat.



Workers' Hospital of Huacho, Northern Peru.



Medical services rendered by the Workers' Hospital of Huacho, Peru.



Brazil—A worker from the Special Health Service spraying crude oil on the swampy areas around Belem.



Excavations are completed on the Quito, Ecuador, sewer installations being carried on under the direction of the Health and Sanitation Division of the Coordinator of Inter-American Affairs Office.

The benefits of the inter-American health and sanitation program will be available to millions of people in the other American republics. These people include workers in the Amazon forests and in the jungles of Central America; miners in the mineral-producing countries of the hemisphere; highway workers in Central America; workers on fiber and quinine plantations; workers on strategic defense bases. These workers in strategic projects receive immediate and direct benefits from the scores of hospitals, health centers, sewage and water supply and other projects completed or underway.

But the indirect benefits extend much further. Let me digress to explain why. Most of Middle and South America lie in tropical and semi-tropical climate. These tropical areas include the immense Amazon basin, an area almost as large as the United States. In the tropical climates, with their heat, humidity and primitive jungles, disease always has been a primary problem, whether in economic development or in defense strategy. In tropical areas, the malaria-carrying mosquito is the deadliest foe of man. Malaria has taken countless lives in the tropics—and still takes a heavy toll. On Bataan Peninsula, in the Philippines, malaria did more than Japanese bullets to weaken our brave fighting men.

In the tropical Americas, as at Bataan, malaria saps the strength of men and kills many of those who become infected. Industrial enterprise in the tropics, therefore, first must reckon with health and sanitation measures to protect those who must work in humid and hot climates within reach of the malarial mosquito. This is the background of much of the health and sanitation work now being carried out on the basis of the Rio de Janeiro recommendations.

The tropical Americas hold some of the richest natural resources on earth, including supplies of rubber, fibers and other strategic materials formerly imported mainly from the tropical areas of the Far East. It was inevitable that wartime mobilization of hemisphere resources would center in large part within malaria-infested regions, such as the Amazon basin. So, in these tropical climates, the chief work is the malaria control. This work involves drainage operations for elimination of mosquito breeding places, spraying and oiling of stagnant pools, building of hospitals and health centers to care for the sick, distribution of anti-malarial drugs. All who come



within radius of this work benefit from it, whether it be a rubber tapper or an inhabitant of a malaria-harrassed community engaged in some other occupation. The mosquito makes no distinction between a rubber tapper and a citizen in some other line of work. In the tropics, where malaria abounds, everybody lives under the threat of infection. Thus, while tying directly into the development of economic resources, the malaria control projects spread their benefits far and wide.

This is characteristic of public health work. No favorite group of special privilege reaps the reward of public endeavor in this field. Poor or rich, all stand to benefit from improvement of public health conditions, whether it be control of malaria or the improvement of water supply. The airplane, the railway, the modern highway have increased the dangers of swift spread of disease, once it starts on an epidemic course. This is true of malaria as of other diseases.

So the Good Neighbor spirit finds eloquent expression in such work as the campaign against malaria now being waged in the Amazon countries, Central America, Haiti. Along the Amazon River and its tributaries, there is being established a chain of hospitals, health centers and floating dispensaries. This chain of malaria control posts runs for more than 2,000 miles from Belem, near the mouth of the Amazon, far inland to the headwaters of the Amazon in Bolivia, Peru, Ecuador, Colombia. A unique fleet of floating dispensaries is in operation and is being expanded. These are motor launches, equipped with medical supplies and doctors, to reach remote sections of the Amazon country, far away from the few centers of population.

The work in Brazil affords a good illustration of the cooperative aspects of the inter-American program. Brazil has set up a special agency known as the Servico Especial de Saude Publica. This agency is a channel for cooperation with the Institute of Inter-American Affairs, an agency of the Office of Inter-American Affairs. Assigned to Brazil by the Institute are forty United States doctors, sanitation engineers and other specialists. Brazilian specialists and technicians number more than four hundred, in addition to 2,500 other employees. Brazil contributes funds, along with materials, labor, equipment. Altogether these contributions make a cooperative undertaking on truly inter-American lines.

This is pretty much the pattern of the work in other countries. In Spanish speaking countries, most of the republics participating in the program have organized similar agencies known as a "Servicio Cooperativo Interamericano de Salud Publica." Where they are able financially, the participating countries contribute funds to supplement contributions of the United States. Their contributions also include supplies, land, labor. On the whole, this health program may justifiably be described as one of the highest expressions of inter-American cooperation, on a foundation of peaceful, friendly relations.

The results of this cooperation will endure long after the war. For instance, extensive training of doctors, engineers, professional and practical workers, nurses and sanitary inspectors is part of the work. These professional and technical workers are being prepared to take their places in the hospitals and the clinics rising in Central and South America. They will join the ranks of the hemisphere's growing forces of public health workers. The knowledge and the skill they acquire will be useful for many years to come. This training work will extend and strengthen public health traditions in other Americas. It will contribute to the elevation of health standards. The increasing body of trained public health workers is just as important as the construction of hospitals and health centers and modern sewage and water supply systems. The training projects are of two types. Under one method, nurses and engineers receive travel grants for training and observation in the United States or Latin American countries. Under the second method, training courses are given locally by the "Servicio" staffs in collaboration with local health departments or hospital staffs.

Training of additional nurses is one of the most urgent aspects of the main program. This work includes the establishment of nursing schools, re-organization of existing nursing schools, provision of advanced and brush-up courses for practicing nurses. In various countries cooperating in the program, girl students are starting courses patterned after those of the leading nursing schools of the United States. The United States Public Health Service and the Pan American Sanitary Bureau are aiding in supplying teacher-nurses and helping to lay out courses of instruction. The project for bringing to the United States two Sisters from each of the

other American republics for training under the auspices of the Catholic Association of Hospitals is part of the training activity.

Thus a broad program is under way to raise health standards in the other American republics. What this may mean for the future of the American peoples, especially in the tropics, is clear to anyone who has studied the basic importance of health work in these countries. Quite properly our sister republics to the south look to the United States for aid in this work. If we are to have genuine Good Neighbor relations as a basis for progress in the Western Hemisphere, it must proceed in an atmosphere of mutual aid. Mutual aid is the motivation of the inter-American health and sanitation program. The United States, in the spirit of mutual aid, contributes out of its great resources of medical knowledge and supplies to the advancement of hemisphere health standards.

I think I can best illustrate what mutual aid means in human terms by telling you the story of how inter-American cooperation functioned in checking a severe epidemic of malaria among the Indians of Colombia's Guajira peninsula. The malaria epidemic threatened a large part of the population, numbering more than 40,000. The Guajira peninsula juts into the Caribbean. Malaria usually is prevalent in varying degrees. Late in 1942, however, it increased to the proportions of a very severe epidemic. Drought during the years 1939-41 had forced a migration of population to wetter sections where malaria existed. Last year, with the arrival of heavy rains, a return flow of population set in. The returning migrants brought with them many cases of malaria. So malaria increased until about 80 per cent of the inhabitants of the southern part of the peninsula were affected, with a mortality rate of 10 per cent.

Fortunately, it was possible through inter-American cooperation to take swift action. Colombia's Servicio Cooperativo Interamericano de Salud Publica, set up as a medium of cooperation in the inter-American health program, organized an emergency expedition. The expedition consisted of three doctors, a laboratory technician and two sanitary inspectors, directed by Dr. Alfredo Landinez, an eminent Colombian physician. The expedition carried diagnostic equipment, anti-malarial drugs and materials to control mosquito breeding. The Colombian ministry of war provided airplanes to

move men and supplies to Uribia, center of the affected area. The United States military attache at Bogota managed to get a "jeep" for the expedition. The United States naval attache provided air transportation for Dr. John Bugher of the Rockefeller Foundation, and for members of Dr. Landinez' party. Atabrine was sent to the Indians in large quantities.

By latest accounts, these measures have been successful. The epidemic has been checked. The groundwork has been laid for prevention of another epidemic. Many lives have been saved.

This is only one incident in the inter-American battle against disease which is now being waged on many fronts. Besides malaria, the work includes campaigns against tuberculosis, typhus and other diseases. Anti-typhus vaccine is being sent by air transport into the Bolivian Altiplano to control typhus in the tin mining areas. The Institute of Inter-American Affairs is shipping 100 bottles of the vaccine weekly, enough to vaccinate 1,000 persons. Special disease problems are being tackled as part of the main program. This is illustrated in an effort to control onchocerciasis in Guatemala and southern Mexico. This is a disease which causes blindness. It is estimated 40,000 persons suffer from the disease in Guatemala. The Institute of Inter-American Affairs has allotted \$100,000 to the Pan American Sanitary Bureau to further the work these countries are doing in controlling this disease.

The health and sanitation work is backed up by a food program, undertaken by the Institute of Inter-American Affairs in cooperation with other American republics. Disease and hunger are twin problems in many places. Better food supply is as essential as hospitals and drugs in protecting workers in the Amazon valley, for example. To become healthy, energetic soldiers of production, the workers in our sister republics producing strategic materials must have proper food. Food, consequently, has been linked with health to make what is known as the "Basic Economy" Division of the Coordinator's office. The same cooperative pattern which runs through the health and sanitation work applies to food projects in areas which need increased local production of food, either because they have lost outside supply sources or have increasing need of food in defense and strategic production projects. Like the health and sanitation work, the food program promises to bring lasting benefits

in the improvement of living standards in the Americas.

Health and food are elemental human needs. They are just as elemental in peacetime as in war. The battle against disease and hunger is never-ending. Freedom from disease, freedom from want, are worthy goals of inter-American cooperation, now and for the long pull. When the war ends, doubtless much of the apparatus for arms production and military organization will be dismantled. But the apparatus of the inter-American battle against disease and hunger is essentially the apparatus of peace. Hospitals and training schools, doctors and nurses—these represent progress toward the human goals of peaceful, happy peoples. Through mutual aid, the Americas are learning how to multiply hospitals and training schools, doctors and nurses. Inter-American cooperation in this work is one of the best assurances that we will realize the better world for which we fight.

## BLOOD LOST WITH MENSTRUATION COR- RELATED WITH THE INDIVIDUAL'S BLOOD VOLUME

By SR. M. ALCUIN ARENS, O.S.B., M.T., B.S., R.N., M.S.

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This is a report attempting to show the degree of correlation between the menstrual loss of blood and the blood volume. The test subjects were female students between the ages of fifteen and twenty-three years inclusively.

Menstrual losses were studied on 60 periods. The menstrual blood iron lost per period was determined\*, and this on the basis that all the iron lost came from blood hemoglobin. The periodical menstrual blood loss expressed in cubic centimeters was calculated from the iron loss on the basis that the menses had the same hemoglobin content as the individual's intravascular blood. The blood volume per individual was calculated on the assumed constants: Blood weight as 1/10 body weight, and specific gravity of blood 1.060. The experimental and calculated data are summarized in the table of this paper.

In attempting to correlate the blood volume in cc. against the menstrual loss per period in cc. it was shown that the coefficient of correlation was too insignificant to denote any degree of correlation.

Conclusion—The numerical value of the coefficient of correlation for blood volume against menstrual loss per period of menstruation is so insignificant that it may be concluded there is no degree of correlation between blood volume and blood menses in the same individual.

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\* Iron determination was made by a modification of the method to be found in J. Biol. Chem. XCII (1931), 59.

## MENSTRUAL AND INTRAVASCULAR BLOOD FINDINGS

Case No.	Age yrs.	Wt. Kg.	Intrav. Blood		Menstrual Findings		
			Bl. Vol. cc.	Hb gm. %	Fe mg.	Hb gm.	Blood cc.
7	21	57.27	5402	11.9	29.3194	8.752	73.5
12	21	43.18	4073	12.5	10.7568	3.169	23.7
17	21	65.91	6217	11.6	21.8542	6.523	56.2
22	23	50.00	4716	13.3	17.4185	5.199	39.0
23	20	62.72	5916	11.9	27.4130	8.783	68.7
26	20	62.27	5874	12.9	11.3984	3.402	26.3
27	19	67.27	6346	11.5	10.4640	3.123	27.1
28	19	58.18	5488	11.4	18.3736	5.484	48.1
31	21	56.81	5359	13.6	31.1708	9.304	68.4
46	21	59.54	5617	12.7	33.4780	9.691	76.3
					48.6380	14.518	114.3
50	19	54.54	5145	11.9	32.8496	9.805	82.4
62	16	44.54	4201	12.2	19.7352	5.891	48.3
89	17	52.27	4931	12.1	14.4630	4.317	35.6
					25.4280	7.590	62.7
101	21	53.63	5059	12.8	12.7686	3.811	29.7
102	21	52.27	4931	12.5	15.0732	4.499	35.9
103	20	52.72	4973	13.2	23.9424	7.087	53.6
104	20	59.09	5574	12.4	48.4136	14.451	116.5
106	19	54.54	5145	12.2	6.7246	2.007	16.4
					19.0732	5.693	46.6
					26.8116	8.003	65.6
107	20	61.36	5788	12.5	25.1722	7.514	60.1
108	20	59.00	5566	12.4	33.3333	9.949	80.3
109	21	51.81	4888	12.2	13.7208	4.095	33.5
110	20	56.81	5359	11.0	51.1056	15.255	138.6
111	19	68.18	6431	11.8	19.1984	5.730	48.5
117	22	77.27	7289	12.5	23.4053	6.986	55.9
					7.6568	2.285	18.3
118	18	52.27	4931	13.0	13.6732	4.015	31.4
123	21	49.09	4631	11.3	42.1278	12.575	111.3
124	20	43.63	4116	12.5	15.2340	4.547	36.4
125	20	43.63	4116	12.6	15.4266	4.604	36.5
126	18	53.63	5059	11.6	16.0496	4.791	41.3
128	18	68.18	6431	11.8	9.6704	2.886	24.4
129	18	59.09	5574	11.5	16.3052	4.867	42.3
132	18	59.09	5574	10.5	21.4493	6.402	60.9
135	19	60.23	5682	11.4	24.5496	7.328	64.3
138	18	56.81	5359	12.0	29.7639	8.884	74.0
139	17	45.45	4287	12.3	27.2480	8.132	66.1
					24.0984	7.193	58.5



## MENSTRUAL AND INTRAVASCULAR BLOOD FINDINGS

Case No.	Age yrs.	Wt. Kg.	Intrav. Blood		Menstrual Findings		
			Bl. Vol. cc.	Hb gm. %	Fe mg.	Hb gm.	Blood cc.
140	19	65.91	6218	12.5	17.1646	5.223	40.9
142	18	50.00	4716	12.6	59.4280	17.739	140.8
145	18	52.27	4931	10.8	23.1568	6.912	64.0
151	23	75.00	7075	12.3	16.5658	4.948	40.2
					21.3568	6.375	52.3
					20.7280	6.187	50.3
153	17	59.31	5595	12.3	30.5528	9.060	73.6
154	23	54.54	5145	11.5	19.6762	5.873	51.9
155	18	52.27	4931	12.7	21.3180	6.360	50.0
157	19	67.29	6348	10.4	18.0217	5.379	51.7
161	20	59.09	5574	11.8	59.3814	17.728	150.2
162	20	50.00	4716	11.6	25.3920	7.579	65.3
164	17	58.18	5488	13.0	16.5520	4.940	38.0
169	15	40.90	3858	12.1	7.1640	2.138	17.6
178	17	59.09	5574	12.6	66.6370	19.891	157.8
180	18	56.81	5359	13.0	31.0472	9.267	71.3
181	21	72.72	6860	12.8	17.2803	5.158	40.3
197	20	52.27	4931	13.2	5.1984	1.551	11.7
					9.151	2.731	20.7

## ABSTRACTS

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**IMMUNITY IN BRUCELLOSIS:** I. F. Huddleson, *Bact. Rev.*, vol. 6, No. 2, 1942, p. 111.

This article reviews the data on active immunity to brucellosis. Proof of acquired immunity after clinical or sub-clinical manifestation of brucellosis is based on several specific tests: blood culture, serum agglutination, whole blood opsonic, and skin sensitivity tests. All of these tests except blood culture are valuable means of obtaining information indicative of previous clinical or sub-clinical infection. It has been found that acute and ambulant cases show the same detectable serum antibodies or skin sensitivity reaction.

Huddleson, Johnson and Hamann showed that when most of the neutrophils in citrated whole blood of a normal individual showed a marked capacity for ingesting brucella cells a previous infection or a high degree of resistance of that individual existed. There were some few exceptions. In a small percentage of clinical cases leucocytes show a high degree of phagocytosis and likewise a small percentage of long recovered cases show a low ingestion power.

As yet no safe or thoroughly effective vaccine for human use has been found. The vaccine used so far is a suspension of one or more species of *Brucella* killed by heat or chemicals.

**A PREPARATION FROM SPOILED SWEET CLOVER:** Allen, Barker & Waugh, *J.A.M.A.*, 120, 1009-1015, Nov. 28, '42.

Studies on cattle that bled considerably and often fatally led to the discovery of dicoumarin in improperly cured hay from sweet clover. Dicoumarin was found to reduce the prothrombin content and delay the coagulation time. In 1941 it was synthesized. It may replace heparin in the prevention of arterial or venous thrombosis, in pulmonary embolism, in preventing extension of intravascular thrombosis, etc.

It seems to affect prothrombin only. Its mode of action is not known but apparently something within the body is involved because if added to drawn blood, dicoumarin does not influence the prothrombin time. Patients receiving it show increased sedimentation rate and sometimes a retarded clot retraction.

In experimental dogs hemorrhage could only be produced by large prolonged doses when the prothrombin had been greatly depleted.

**HISTORY OF THE STAINING OF BLOOD AND PARASITIC PROTOZOA: H. J. Conn, Stain Tech., vol. 3, No. 6, 1928, p. 127.**

Ehrlich in 1879 combined acid and basic dyes for staining blood cells and was the first to recognize the difference between acid and basic dyes and to appreciate this difference in staining. He used acid fuchsin and methyl blue.

Romanowsky used eosin and methyl blue. His great contribution was not in the composition of the stain but in the demonstration of the nucleus of a parasite in the blood by means of it. This increased interest in stained blood smears.

Unna in 1891 published the formula of his polychrome methyl blue which is an important constituent of nearly all modern stains.

In 1898 Nocht contributed the next important step by using Unna's polychrome methyl blue in the Romanowsky combination. He obtained a precipitate but ignored this and used the solution for staining. In 1899 Jenner collected this precipitate and found that when dissolved in methyl alcohol it made an excellent stain though it lacked the nuclear staining reaction principle of Romanowsky's and Nocht's. In 1901 Reuter using the same precipitate dissolved it in anilin oil and absolute alcohol and Leishman dissolved it in alcohol.

Wright's stain is really a Leishman stain, differing only in the preparation of the polychrome methylene blue but it is sold under this name because this is the way it is best known to the public.

**CLOT RETRACTION TIME IN THROMBOPHLEBITIS & PULMONARY EMBOLISM: J. S. Hirschboeck & W. T. Coffey, Jr., Am. Jr. Med. Sci., vol. 205, No. 5, May, 1943.**

It has been demonstrated that in a variety of surgical conditions

more serum was formed during the early 15-min. periods after coagulation in those cases exhibiting cachexia or infection. These observations may explain why some patients have pulmonary embolism. The early formation of serum is the result of rapid and strong clot retraction, and if a thrombus has recently formed in such a patient, it is possible that pulmonary embolism will occur because of the great ease with which the thrombus detaches itself from the vessel wall.

The work of the authors of this article demonstrates that in 9 out of 10 cases of pulmonary embolism, the clot retraction time was less than 10 minutes. Normals varied from 25-35 minutes.

The sedimentation rate of erythrocytes is, for the most part, determined by the fibrinogen levels of the blood plasma. When the fibrinogen increases, the sedimentation rate is more rapid. Therefore, blood with a rapid sedimentation rate contains more fibrin when in the coagulated state. It is this increase in the fibrin matrix of the clot which is probably responsible for its more rapid and forceful retraction.

In anemia, the erythrocyte concentration, as measured by the hematocrit, is below the normal of 45%. In such cases the plasma portion of the blood with its dissolved fibrinogen is proportionately much greater than the erythrocyte percentage. When these clots retract, the amount of inert erythrocyte bulk filling the spaces between the mesh is less and the amount of fibrin is more than normal. There is then a more rapid and powerful clot retraction. In erythemia the reverse is true.

Sedimentation rates and erythrocyte concentrations on 126 cases bore out this relationship.

The authors found that small amounts of heparin as well as sodium citrate and sodium fluoride greatly prolong the clot retraction time. They did not offer any explanation of the mechanism of this action but suggested that the prophylactic use of heparin in patients with short clot retraction times should reduce the incidence of pulmonary embolism.

**A METHOD FOR THE RECLAMATION OF AGAR:** O. F. Edwards, *Proc. Soc. Exp. Biol. & Med.*, 51, 1, Oct., '42.

The method outlined is reported as successful for small amounts

but has not been used as a commercial method. The agar medium is pooled, autoclaved at 15 lbs. for 15 min. and the pH adjusted to 7.0. The melted agar is poured into an ice cube tray, solidified, cut into convenient pieces and frozen in an electric refrigerator. It is put into a gauze sack and thawed at room temperature. The water draining off carries with it much of the soluble material in the agar including the waste products from the previous growth. Distilled water is added to make up the volume, the mass is melted, cooled to 55°C. One egg white is added for each 2L. of agar mass. The mixture is boiled until the egg is completely coagulated and is then filtered hot. The freezing and thawing process is then continued alternately as often as necessary with the final thawing on coarse filter paper. The remaining agar is dried at 55°C.

For the reclamation of agar from media containing dyes, the mass is dialyzed in running water 12-24 hrs. after the first freezing and thawing. Dyes may be completely removed by boiling with animal charcoal. Endo, EMB and blood agar were processed the same as nutrient agar. No work has been done on the sugar media but, the author suggests that the same method will probably be feasible.

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*\* Preceding abstracts were contributed by the Chicago Society of Medical Technologists and represent literature reviewed by its members at the June meeting.*

**THE EXTERNAL SECRETION OF THE PANCREAS AND DIABETES MELLITUS: H. M. Pollard, L. Miller & W. A. Brewer. Am. Jr. Diges. Dis., vol. 10, No. 1, Jan., '43, p. 20.**

The secretin test was used on 13 known diabetics ranging in age from 10 to 64 years with known disease duration ranging from less than 1 year to 17 years. Duodenal-pancreatic juices and gastric juice were withdrawn before the administration of secretin and continuously thereafter fractionating at definite intervals of 20 and 10 minutes.

The tendency was for diabetics to show a diminished volume secretion, a low bicarbonate secretion, low amylase activity and possibly low tryptic activity. \*There was no apparent correlation with age or insulin but, all except one case showing these changes had had the disease 3 years or longer.

**AN ANAEROGENIC VARIANT OF SALMONELLA ENTERITIDIS (GAERTNER) ISOLATED FROM AN ENZOOTIC AMONG DOMESTIC AND WILD RATS: R. A. Bruce & H. E. Dascomb, Jr. Inf. Dis., vol. 72, No. 2, Apr., '43, p. 157.**

This work was undertaken when normal and experimental albino rats were dying unexpectedly. These rats and 4 wild rats caught in the same building were studied. An anaerogenic variant of *Salmonella enteritidis* was isolated. Since this organism resembled *E. typhosa* in its fermentation reactions, serological procedures were necessary to identify it. The wild rats were thought to be the source of the infections.

**A COMPARISON OF THE ANTIGENIC PROPERTIES OF STAPHYLOCOCCAL VACCINE, STAPHYLOCOCCAL TOXOID AND THE TWO IN COMBINATION: S. Etris, Jr. Immun., vol. 46, No. 5, May, '43, p. 309.**

In rabbits staphylococcal toxoid produced a high antitoxin titre but did not stimulate the production of agglutinins while the opposite results were obtained when staphylococcal vaccine was administered. A combination of the two brought about the development of both kinds of antibodies. Circulating antitoxin dropped almost to pre-injection levels in 6 weeks while the agglutinin titre remained high.

Injection of vaccine-toxoid at 14 day intervals induced a progressive rise of both types of antibodies.

**HYPOPROTHROMBINEMIA AFTER SALICYLATE ADMINISTRATION IN MAN AND RABBITS: S. Rapoport, M. Wing & G. M. Guest, Proc. Soc. Exp. Biol. & Med., vol. 53, No. 1, May, '43, p. 40.**

Injection of 0.5 cc. methyl salicylate per kg. produced severe hypoprothrombinemia in rabbits within 48 hrs. Fifteen rheumatic patients 6-14 yrs. of age receiving salicylate medication 2-21 days were observed. Thirteen received sodium salicylate and 2 acetylsalicylic acid. Doses ranged from 1.5 - 8 g. daily. Eight of these patients showed a marked prolongation of the prothrombin time. The question of its being a result of liver damage is advanced and the suggestion made that the possibility of counteracting this effect by the administration of vitamin K be studied.

**TREATMENT OF DIABETES MELLITUS WITHOUT REGARD TO HYPERGLYCEMIA AND GLYCOSURIA: H. J. John. *Am. Jr. Diges. Dis.*, vol. 10, No. 4, p. 129.**

The author describes a recent tendency to keep the diabetic comfortable without regard to hyperglycemic states. He advocates a blood sugar before each meal during insulin regulation. Even if protamine insulin is used, a single injection may not give a sufficient spread to avoid long intervals of hyperglycemia during the 24 hour interval and two injections may be preferable. Continued hyperglycemia in a diabetic leads to a progressively worse diabetic state.

**GASTRIC ACIDITY FOLLOWING GASTRIC RESECTION: C. W. Holman & B. McSwain, *Surgery*, 13, 6, June, '43, p. 916.**

Since small gastric resections often do not reduce acidity sufficiently and large resections are much more hazardous especially in case of a recurrence, this study was undertaken to evaluate the post-operative anacidity of various types of resections. Results on 88 cases were as follows:

Removal of the antrum produced reduced acidity or anacidity in 25% of cases.

Removal of  $\frac{1}{2}$  to  $\frac{2}{3}$  of the stomach plus a portion of the lesser curvature proximal to the re-entrant angle resulted in 80% of the patients having reduced acidity or anacidity.

Removal of more than  $\frac{2}{3}$  of the stomach resulted in 90% of the patients having reduced acidity or anacidity.

The advantages resulting from the removal of large portions of the stomach are more than offset by the increased hazards in event of a subsequent operation. Removal of  $\frac{1}{2}$  to  $\frac{2}{3}$  with a portion of the lesser curvature is advocated.

**STAPHYLOCOCCAL VACCINE-TOXOID COMBINED IN HUMAN IMMUNIZATION: F. B. Faust & S. Etris, Jr. *Immun.*, vol. 46, No. 5, May, '43, p. 315.**

The injection of staphylococcal vaccine-toxoid combined stimulated antibacterial and antitoxic substances. Normal individuals who had received 10 injections of the combination showed an average increase in agglutinins of 57-fold and of antitoxins, 10-fold.



**IRON-REFRACTORY ANAEMIA IN HOOKWORM DISEASE: R. Heilig & A. Visweswar. Jr. Trop. Med. & Hyg., vol. 45, No. 15, Aug., '42, p. 113.**

The improvement in the anemia of hookworm disease is usually so immediate on iron medication even before deworming that any failure to respond may be taken as an indication of some additional pathological condition. There may be a multiplicity of conditions only one of which makes the anemia iron refractory. In the study reported, malaria, urinary tract infections, silent middle ear- and sinus-affectations were usually responsible. In practice it is usually best to treat all these infections simultaneously.

**THE EFFECT OF ANTACID THERAPY ON THE PEPTIC ACTIVITY OF GASTRIC JUICE IN MAN: I. A. Warren, J. Front & J. B. Kirsner, Gastroenterology, vol. 1, No. 1, Jan., '43, p. 102.**

Peptic activity was calculated from the photoelectric values for tyrosine obtained from hemoglobin by means of the gastric juice studied. Gastric juice was obtained by histamine stimulation. The antacids were administered twice during the histamine test.

Peptic activity of the gastric juice was diminished by calcium carbonate, aluminum hydroxide and magnesium trisilicate. Inhibitory reaction was greater as the pH approached neutrality except that aluminum hydroxide was more anti-peptic than calcium carbonate at the same pH. The administration of calcium carbonate or aluminum hydroxide hinders the development of ulcerations.

**EFFECT OF TEMPERATURE OF INACTIVATION OF HUMAN, RABBIT AND GUINEA-PIG SERUM UPON THE HEMOLYTIC ACTIVITY OF COMPLEMENT: E. L. Hazen, Jr. Immun., vol. 46, No. 5, May, '43, p. 341.**

Human, guinea-pig and rabbit sera were inactivated at temperatures ranging from 53°C. to 70°C. and their effect upon the hemolytic activity of complement of preliminary incubation was observed. The amount of complement required for 50% hemolysis varied inversely with the inactivation temperature of the serum. These effects are thought to be due to properties of the heated sera which affect the activity of complement rather than to the destruction of antibody by heat.

**PROGNOSTIC BLOOD TESTS IN TUBERCULOSIS. A COMPARISON OF THE RELIABILITY OF FOUR METHODS, BASED ON CLINICAL AND RADIOLOGICAL FINDINGS:**  
J. T. Paterson, *Edin. Med. Jr.*, vol. 50, No. 5, May, '43, p. 288.

This report is based on 30 cases. The following criteria were used:

Blood sedimentation rate: modified Westergren method was used.  
A rate under 10 was found desirable.

Weltmann serum reaction: values under 6 were taken to indicate exudative conditions.

Leucocytic examinations: the work of Medlar was accepted as the basis for interpretation, namely, that neutrophiles predominate in the phase of abscess formation, cavitation and ulceration, lymphocytes are increased in the healing process and monocytes increase with the extension of a tuberculous lesion. The normal blood picture was taken as: total leucocytes per cmm.—6,000-9,000, polymorphonuclear cells—50-65%, lymphocytes large and small—25-39% and mononuclear leucocytes—6-9%.

The prognostic accuracy of these tests was as follows:

Blood sedimentation rate.....	80%
Total count .....	72.4%
Weltmann serum reaction.....	68.5%
Medlar count .....	45%

**A SIMPLE TECHNIQUE FOR THE CULTIVATION OF ORGANISMS FROM SINGLE CELLS:** K. I. Johnstone, Jr. *Path. & Bact.*, vol. 55, No. 2, Apr., '43, p. 159.

Slides are flooded with melted agar and when set are inoculated from a very dilute broth suspension of the organism studied. The slides are incubated at 37°C. for 1 hr. to increase refractility of the organism. They are examined with a microscope and the positions of organisms selected are marked by depressions made with an electrically heated platinum wire. Directions for the construction of the wire are given.

**THE PROTEIN AND FLUID BALANCE IN EXPERIMENTAL SHOCK PRODUCED BY INTESTINAL TRAUMA: J. W. Howland & E. B. Mahoney, Surg., vol. 13, No. 6, June, '43, p. 889.**

Trauma to the bowel wall resulted in progressive damage to the capillaries. Fluid recovered at the site of trauma gave higher albumin-globulin ratios than the circulating plasma. As the shock progressed the capillary walls also became permeable to the larger globulin molecule with the result that the amount of globulin recovered at the site of trauma increased. When the animals were treated with plasma, large amounts of fluid could not be recovered at the site of trauma. One possible explanation is the development of a generalized capillary permeability. The best therapeutic results were obtained when plasma was administered with an equal volume of saline rather than in whole or concentrated form.

## BOOK REVIEW

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### **DIAGNOSIS OF UTERINE CANCER BY THE VAGINAL SMEAR:**

**By G. N. Papanicolaou, M.D. and H. F. Traut, M.D. Published by the Commonwealth Fund, New York, 1943, pp. 46. Price \$5.00.**

The subject material in this volume is based upon the study of vaginal smears of 3,014 women examined in the Woman's Clinic at the Cornell University—New York Hospital Center, in the Memorial Hospital and in the Woman's Hospital. In the group 193 women were found to have carcinoma involving the genital tract.

For many years Papanicolaou has studied the cytology of the vaginal mucosa both in animal and man, establishing as a result of this painstaking work morphologic patterns, which denote health and disease. Probably the first practical clinical application was his vaginal smear technic applied to the sex hormone problems of women.

In the routine study of the present series of women the authors have accumulated data on an important, simple and inexpensive method for the diagnosis of cancer of the female genital tract. As they point out, there are many criteria in the cellular pattern that suggest malignancy. These are covered in the text and well illustrated in the excellent color plates of which there are eleven.

The technic of preparing vaginal smears, staining procedures and discussion of differentiation between normal and abnormal cells as found in the normal person, in benign disorders and in malignancy constitute the reading matter. Finally, the authors do not recommend the vaginal smear as the means of ultimate diagnosis. They attest its value in the sorting process and emphasize patient and repeated search of multiple preparations as necessary to successful use in the diagnosis of malignancy.

A brief bibliography precedes the last section devoted to color plates and legends. It is a most intriguing presentation and worthy of the diagnosticians thought and study.

## NEWS AND ANNOUNCEMENTS

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### AMERICAN-SOVIET MEDICAL SOCIETY PRESIDENT HONORED BY RUSSIAN ACADEMY OF SCIENCES

Dr. Walter B. Cannon, president of the American-Soviet Medical Society, was formally inducted as a member of the Academy of Sciences of the U.S.S.R. at a reception given in his honor by the Soviet Embassy on Thursday, August 12th. Dr. Cannon, who is professor emeritus of physiology at Harvard, is the first American to be a member of both the Academy of Sciences of the United States and that of the U.S.S.R.

In conferring the honor, the Academy of Sciences of the U.S.S.R. stated that they were "profoundly confident that the hour is not far off when we Russian, British, and American scientists and our colleagues in other countries will meet at an international congress to share scientific achievements which will have helped bring back peace and freedom to humanity."

The American-Soviet Medical Society which Dr. Cannon now heads has been organized to stimulate the exchange of medical information between this country and the Soviet Union. Dr. Cannon has done much to encourage this exchange. A paper he delivered several years ago before the International Congress of Physiologists in Moscow met with great acclaim.

The national headquarters of the society are at 130 West 46 Street in New York City. The American Review of Soviet Medicine, its publication, maintains editorial offices at 1900 East Monument Street in Baltimore.

Two other American scientists, Dr. Ernest O. Lawrence, professor of physics, and Dr. Gilbert N. Lewis, professor of chemistry, both at the University of California, were similarly honored.

### AMERICAN-SOVIET MEDICAL SOCIETY CHAPTER LAUNCHED IN DETROIT

The American-Soviet Medical Society, recently organized to stimulate the exchange of medical information between the United States and the Soviet Union, formally launched its Detroit chapter on Wednesday evening, August 18th, at a meeting held at the WWJ auditorium. Professor Vladimir V. Lebedenko of the Department of Surgery at the First Moscow Medical Institute, who is at present in the United States as official representative of the Russian Red Cross, was the chief speaker. He described his experiences with Soviet war medicine and particularly with new methods of treating shock at the front.

Dr. Warren B. Cooksey, head of the Michigan Blood Bank, presided. The gathering was addressed by Dr. Barris, head of the Detroit chapter of the American Red Cross; Dr. Bruce H. Douglas, commissioner of the Detroit Board of Health; a representative of the Wayne County Medical Society; and the executive secretary of the American-Soviet Medical Society.

Professor Lebedenko was the guest of the Detroit chapter of the American Red Cross before the meeting and made visits to various Detroit hospitals during his stay there.

### NINTH ANNUAL MEETING OF MISSISSIPPI VALLEY MEDICAL SOCIETY AT QUINCY, ILL., SEPT. 29-30

A splendid program has been arranged for the Ninth Annual Meeting of the Mississippi Valley Medical Society at Quincy, Ill., Sept. 29-30. Over 20 leading clinician-teachers will put on the usual intensive program that has always featured this—"The Mid-West's Greatest Intensive Post-Graduate Assembly for General Practitioners." The first day will feature an All-Chicago program (arranged by Dr. W. O. Thompson, Associate Prof. of Medicine, Northwestern University) with a complimentary stag buffet supper. There will be a big Exhibit Hall and the usual Fellowship Hour and Banquet that has always been one of the attractive features of this

annual meeting. A partial list of the speakers includes, Brigadier General Fred W. Rankin, Immediate Past President of the American Medical Ass'n., Dr. Geo. W. Post of Chicago, President of the Illinois State Medical Society, Dr. A. W. McAlester, Jr., of Kansas City, President of the Missouri State Medical Ass'n., Dr. Warren H. Cole, Head of the Dept. of Surgery, University of Illinois, Dr. Robert W. Keeton, Head of the Dept. of Medicine, University of Illinois, Dr. Paul B. Magnuson, Head of the Dept. of Bone and Joint Surgery, Northwestern University, Dr. John de J. Pemberton and Dr. Samuel F. Haines of the University of Minnesota, Dr. Leroy H. Sloan, Prof. of Medicine, University of Illinois. Dr. Willis M. Fowler, Associate Prof. of Medicine, University of Iowa, Dr. Archibald L. Hoyne, Prof. of Pediatrics, University of Chicago and University of Illinois, Dr. Raymond W. McNealy, Associate Prof. of Surgery, Northwestern University, Dr. George J. Rukstinat, Associate Prof. of Pathology, University of Illinois, Captain H. L. Dollard, M. C., U. S. Navy, Senior Medical Officer at Great Lakes, Ill., Dr. Charles H. Phifer, Prof. of Surgery, University of Illinois, Dr. M. M. Cook and Dr. Julius Jensen of Washington University, etc.

The entire program will be practical and will be keyed to war-time medicine. All ethical physicians are invited to attend. Medical officers of the army and navy are cordially invited to be guests of the society if they register in service uniform. A detailed program of the meeting may be obtained from the Secretary, Harold Swanberg, M.D., 209-224 W. C. U. Building, Quincy, Illinois.



## STATE AND LOCAL SOCIETIES

This Department of the American Journal of Medical Technology will be devoted to announcements appertaining to *your* Societies of Medical Technologists and Clinical Laboratory Technicians. We will endeavor to serve, with your cooperation, as publicizer of your meetings and proceedings.

With the ever increasing membership and affiliations of the State and Local Societies with the American Society of Medical Technologists, this Department should prove interesting and informative.

Having been appointed a member of the Editorial Staff and Coordinator of this Department, I shall be anticipating your tentative program for the ensuing year, with names of the officers and their title in your society.

Cecilia M. Kortuem, R.N., M.T. (A.S.C.P.)

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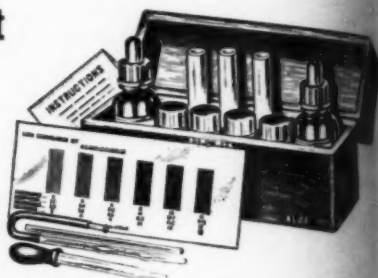
A. Goth, "A Simple Clinical Method for Determining Sulfonamides in Blood," *Journal of Laboratory and Clinical Medicine*, Vol. 27, No. 6, March 1942.

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